Texas On-Site Insights
Information about On-Site Wastewater Treatment Systems in Texas
Volume 6, Number 1, March 1997

TNRCC Works to Educate the Public About New Rules Through Workshops, Publications, WWW

Since the new rules regulating on-site wastewater treatment and disposal systems were approved earlier this year, officials with the Texas Natural Resource Conservation Commission (TNRCC) have been working feverishly to educate industry professionals, regulatory agencies and the public about what the new rules will mean for them.

TNRCC efforts have taken a number of forms, some more visible than others.

Workshops Conducted Throughout Texas

For example, agency staff have conducted half-day workshops at many sites throughout Texas. At the workshops, TNRCC staff present a thorough overview of many aspects of the new regulations including technical guidance, training, certification and enforcement.

The response has been overwhelming and at almost every site the attendance has been much greater than anticipated. So many people came to the Austin workshop that a second room had to be used and there weren't enough handouts to meet the demand. At Amarillo, a second session had to be added to accommodate those who wanted the information. In all, TNRCC officials estimate that more than 2,200 people attended the workshops. "We've been very successful at generating interest in the new regulations," says Warren Samuelson, who works with the TNRCC Occupational Certification Section and is also the executive secretary of the Texas On-Site Wastewater Treatment Research Council. "The level of interest in the new rules has actually been significantly higher than we anticipated. It's great

that so many people want the information. It's a challenge to develop and supply it to all the people who want to learn more."

New TNRCC Report Describes the Rules

A popular resource that was recently developed by TNRCC to inform the public about the new rules is a new report titled "On-Site Sewage Facilities (OSSF) Workshops" (TNRCC report #RG-276/ EV). This report describes many aspects of the rules in straight-forward, easy to understand terms. Copies of the report are available by contacting the TNRCC on-site wastewater section at (512) 239-0028.

For example, it contains new TNRCC Regulatory Guidance Documents covering such topics as "Permitting and Permit Fees," "Soil Analysis for OSSF Site Evaluation," "Use of the American Society for Testing and Materials (ASTM) Standard Specifications for Pre-Cast Concrete Septic Tanks," "Use of Pretreatment/ Trash Tanks with Aerobic Wastewater Treatment Units," "Use of the Climatic Atlas of Texas," "Treatment and Disposal of Graywater," and many technical topics. Another TNRCC Regulatory Guidance Document in the report, "Certification of OSSF Installers, Apprentices, Designated Representatives and Site Evaluators," covers training and certification issues.

An especially useful part of this guidance document is that it answers many basic questions about training and certification requirements that TNRCC is often asked. For example, some of the questions and answers in this section include the following: "What are requirements for certification?," "When will the application forms be available?," "Will I be grandfathered in if I am already certified?", "What type of experience do I need to be able to be certified?," and many others.

The report also includes a complete copy of the new rules (including text, tables and figures) regulating on-site sewage facilities as published in Chapter 285 of the Texas Water Code.

Many aspects of the previous and new OSSF regulations are compared in a comprehensive side-by-side analysis. Broad topics that are included in the comparisons cover such issues as general requirements, facility planning, submittal requirements for planning materials, cluster systems, additional requirements for surface irrigation systems, delegation to authorized agents, general application requirements and fees for programs administered by the TNRCC, site evaluation, setback and separation requirements, criteria for many types of on-site wastewater treatment systems, maintenance and management practices, OSSFs on the recharge zone of the Edwards Aquifer, and graywater treatment and disposal. "We wanted to give industry professionals and the public a ready reference guide they could turn to where they could see rapidly see how the new rules change the way they will have to operate," Samuelson says. "Hopefully, this format will provide users with the information they need in a format they like."

"We felt it was important that individuals affected by new rules had something they could take home and read that would answer many of the technical questions about the rules in

a comprehensive manner," Samuelson said. "Obviously, we couldn't cover everything at the training workshops. We hope this report fills in a lot of the blanks."

Other Efforts

In addition to the efforts described above, TNRCC staff are also working on many other projects that will aid in the education about and implementation of the rules.

For example, Samuelson is now leading efforts to develop training materials, hire instructors, and create a training schedule. He says TNRCC hopes to make training information available to all the affected parties as soon as it becomes available.

In addition, TNRCC on-site field staff are receiving training in the new rules so they can answer questions from interested parties in their individual regions.

Some information about the new rules is also available on the Internet. For example, the full text of the new rules is available on the TNRCC World Wide Web (WWW) site (http://tnrcc.state.tx.us) and the WWW site of the Texas On-Site Wastewater Treatment Research Council (http://towtrc.tamu.edu), which is developed and maintained by the Texas Water Resources Institute at Texas A&M University.

NOTE: Information about the new rules will be provided in the "Texas On-Site Insights" newsletter and on the Council web site as soon it becomes available. For the most updated information about the new rules, contact Samuelson of the TNRCC at (512) 239-4799 or e-mail his secretary, Annette Maddern, at amaddern@smtpgate.tnrcc.state.tx.us.

Plan Now to Attend Annual Texas On-Site Wastewater Conference; April 13-15 in Plano

Make plans now to attend the Fifth Annual Conference of the Texas On-Site Wastewater Treatment Research Council. The conference will be April 13-15 at the Plano Convention Centre.

A full copy of the tentative conference program is included on page 3 of this issue. Topics to be discussed include recent changes to TNRCC on-site regulations, soil as a treatment system, site characterization and evaluation, sand filter design, soils evaluation, septic tank treatment and design, operation and maintenance, wastewater treatment options, high- strength wastewater, cluster systems, effluent filters, and inspecting existing systems.

The registration fee is $60 after March 23. Registration fees must be sent to Mary Garrett and Associates, Inc., who is organizing the conference. Their fax number is (512) 225-4505. The conference hotel is the Harvey Hotel. Their phone number is (214) 578-8555.

For details, contact Warren Samuelson of the Texas Natural Resource Conservation Commission (TNRCC) at (512) 239-4799, or e-mail his secretary, Annette Maddern, at amaddern@smtpgate.tnrcc.state.tx.us.

Texas House Committee Publishes Report on On-Site Systems

A committee of the Texas House of Representatives recently published a report about on-site wastewater systems in Texas.

The report, titled "Interim Report to the 75th Texas Legislature," was produced in 1996 by the House of Representatives Committee on Natural Resources. The committee was chaired by Representative David Counts of Knox City. Tracy King of Uvalde was chairman of the subcommittee on the on-site wastewater treatment program. Brian Sledge, general counsel and chief clerk of the committee, helped write much of the report. The committee was charged by the Speaker of the House, James "Pete" Laney to undertake the interim study.

The report describes many issues relating to on-site wastewater, the statewide growth in the number of on-site systems, subdivisions without adequate sewage facilities, installation of inappropriate systems, and improper maintenance.

For example, it notes that the number of permit applications for on-site systems in Texas nearly doubled during the 1990s. In fiscal year 1995, more than 38,000 permit applications were processed by the Texas Natural Resource Conservation Commission (TNRCC). The vast majority of permits for on-site systems (95%) were issued by local authorized agents, while only 5% were processed by TNRCC staff, the report says. Also, the report shows that roughly one-third of Texas' population relies on on-site systems for wastewater treatment.

The report was written before the new TNRCC rules went into effect this year. "The study focused on identifying measures to decentralize state authority and increase local government participation in the administration of the on-site program," Sledge says.

The report includes a review of the program structure in place to regulate on-site systems, a summary of rules revision efforts, proposed rules changes, and concerns of the TNRCC and local governments. It also describes regulatory issues including regional solutions, earmarking certification funding, and the operations and activities of the Texas On-Site Wastewater Treatment Research Council.

The report also discusses such issues as cluster systems, low-income assistance, small community financing, and potential funding sources including the Small Community Emergency Loan Program and the Safe Drinking Water Act Revolving Fund.

The report can be purchased from the House Document Distribution Division at (512) 463-1144.

Tentative Program for the 1997 Texas On-Site Wastewater Treatment Research Council Annual Meeting

Sunday, April 13, 1997
12 p.m. - 5:00 p.m. Exhibit move in and registration
5:30-7:30 Reception. Visit Exhibits.

Monday, April 14,1997
7:30-8:20 Registration. Visit Exhibits.

General Session
8:20-8:50 Welcome -Franz Hiebert, Chairman, On-Site Wastewater Treatment Research Council
8:50-9:50 Soils as a Treatment Unit - Jerry Tyler, University of Wisconsin
9:5-10:20 Break. Visit Exhibits. Refreshments.

Concurrent Sessions

Session I - Sand Filters
10:20-11:05 Single Pass Sand Filters: Design, Operation and Maintenance-Terry Bounds, Orenco Systems, Inc.
11:05-11:50 High Rate Application/ Recirculating Sand Filters / Operations and Maintenance - Glenn Turner, Texas Natural Resource Conservation Commission (TNRCC)

Session II - Small Business Needs
10:20-10:50 Incorporating the Internet into Your Business - Paul Fredrickson, North Texas Small Business Development Center (NTSBDC)
10:50-11:20 Product Commercialization - Jim Berish, NTSBDC
11:20-11:50 Preventative Business Maintenance: Management in the Pro-Active Mode - Jeff Blatt, NTSBDC
11:50-1:10 Lunch on your own

Concurrent Sessions

Session I - Soils Characterization and Evaluation
1:10-2:40 Soils Characterization and Evaluation - C. Thomas Hallmark, Texas A&M University (TAMU)

Session II - Characterization of High Strength Wastes
10-2:40 High Strength Waste Steams and Important Factors for Evaluating Treatment -Bill Stuth, Stuth Company
2:40-3:10 Break. Visit Exhibits. Refreshments.

Concurrent Sessions 3:10-4:40

Session I - Operations and Maintenance

3:10-4:40 Operation and Maintenance Requirements of On-Site Systems -Dave Lenning, Washington State On-Site Training Center

Session II - Treatment of High Strength Wastes

3:10-3:40 Sizing of Aerobic Systems-Calvin Locker, Consolidated Treatment Systems
3:40-4:10 Treating High Strength, Case Studies Using the Nibbler -Craig Goodwin, Northwest Cascade, Inc.
4:10-4:40 Aeration Pretreatment System - Terry Hoage, Sam Houston State University

Tuesday, April 15, 1997

Concurrent Sessions

Session I - Treatment and Disposal Systems
8:15-9:15 Overview of Treatment and Disposal Systems-Bruce Lesikar, Texas A&M University
9:15-9:45 Training Center Success Story: History, People, Construction, and Action, James Bohon, Bohon Septic, contact

Session II - Septic Tank Technologies
8:15-8:55 Septic Tank Systems: Sizing, Designs, and Construction-Terry Bounds, Orenco Systems, Inc.
8:55-9:45 Assuring Septic System Maintenance with Wastewater Filters - Harry Nurse, Zabel Industries, Inc.
9:45-10:15 Break. Visit Exhibits. Refreshments.

Concurrent Sessions
Session I - Implementation of Rules, Changes in Standards
10:15-11:45 Michael Fahy and James McCaine, TNRCC
Session II - Inspection of Existing Systems
10:15-11:00 Reinspection of Permitted Systems -- Richard Gerard, Trinity River Authority
11:00 11:45 Real Estate Inspections -- Dave Lenning, Washington
11:45-1:00 Lunch on your own

Concurrent Sessions

Session I - Implementation of Rules - Certification
1:00 - 2:30 Warren Samuelson, TNRCC
Session II - Cluster Systems
1:00-2:10 Collection Systems: Options, Design, Operation and Maintenance -Terry Bounds, Orenco Systems, Inc.
2:10-2:30 Establishment of Legal Operator --TNRCC staff

East Texas School Utilizes Innovative Wetlands for Wastewater Treatment

A school in the small East Texas community of Latexo has decided to use an innovative constructed wetlands to treat its wastewater.

"We are excited about the project because it is low-cost and low-maintenance," says Ken Awtrey of Pineywoods RC&D who helped facilitate the project. "The project could be a usable model for many other East Texas schools because it will treat a relatively high volume of waste using the principles of constructed wetlands to replace a failed conventional system."

Dale Carroll of the Latexo Independent School District examines the root system of this plant used in a constructed wetlands. The system functions well, even during freezing weather.

The project is a joint effort between leaders of the Latexo Independent School District (ISD), the Pineywoods RC&D, Inc., of Nacogdoches, the U.S. Department of Agriculture Natural Resource Conservation Service (USDA/ NRCS) Nacogdoches office, the TLL Temple Foundation in Lufkin, and other groups.

Background Information

For many years, Latexo ISD had to deal with problems caused by its existing conventional on-site wastewater system, which often didn't function properly. "The baseball field, which is near the old drainfield, was often so wet that balls would not bounce on the grass after being hit," says Dale Carroll, who maintains the site for the district. "They'd just hit the ground and stay there."

Clifford Price, who was then superintendent of the school, told the baseball players that right field had "green rain," but also began seriously thinking about whether a constructed wetland would be a viable wastewater treatment strategy. He was particularly impressed that these systems may need little maintenance while providing a high level of treatment.

In 1993, assistant principal Ann Pemberton worked with Ken Awtrey of the Pineywoods RC&D and Joe LaBarbera of the Big 8 RC&D to develop a $25,000 grant proposal that was submitted to the USDA/ NRCS. Dan Schellenberg of Second Nature Systems in Kennard provided information on how these systems work. The school received a $72,000 grant from the TLL Temple Foundation in 1994. A contractor, Goodwin-Lassiter, Inc. of Lufkin, was selected to design the site. A permit to build the system was issued in 1995 and the site was constructed by Tony Doughtie Contractors of Huntsville.

Construction began in February 1996 and wetlands plants were introduced in April. Woolgrass, soft rush, elephant ears, and cattails were obtained from the USDA Plant Materials Center, while other plants were collected locally.

"The drought complicated planting because the site wasn't receiving the amount of wastewater and nutrients it needed to establish the plants," Carroll says. "The fact that school was out also hurt us because you need people in the school to supply wastewater." In addition, the bulrush and cattails were supposed to go dormant and didn't. As an alternative water source, school staff resorted to night-time irrigation.

The system was installed with the help of many volunteers, including agricultural teachers and students, who helped map the site and plant various wetlands species. Much of the work involved installing a second septic tank that would work in combination with the existing unit on the site, excavating the area where two large wetlands cells would be housed, and installing other needed features such as berms, piping, and monitoring equipment.

How the System Works

In basic terms, the system ues two septic tanks for primary wastewater treatment. The existing tank measures 6' deep x 9' wide and 24' long while a newly installed septic tank is 6' deep, 11' wide, and 24' long. The combined capacity of the two tanks is 21,000 gallons. Both tanks are designed to store three days of sewage. The system is designed to treat flows of up to 7,000 gallons per day, a biochemical oxygen demand (BOD) loading of 30 parts per million (ppm), and total suspended solids (TSS) concentrations of 70 ppm.

Wastewater flows by gravity into two clay-lined wetlands cells. The dimensions of each bed are 30' wide x 200' long x 1.5' deep. The system is designed to store a volume equivalent to eight days of wastewater flows. Each bed contains three cells that are designed to store wastewater at depths of 6", 20" and 24". The wetlands are meant to be operated independently, not in series. Narrow catchment areas are sited between the cells to trap sediments. In addition, a rock-filled retaining wall has been built at the end of the final cell to catch duckweed, debris and sediments that could otherwise enter into the finished effluent and lessen its quality. After moving through the system, the wastewaters flow into a contact chlorinator. Following that, they are discharged 200' downstream into a nearby creek.

Water quality samples are collected weekly after chlorination and are analyzed for BOD, TSS, and other parameters. The school's permit from the Texas Natural Resource Conservation Commission requires that wastewaters contain less than 60 ppm BOD and less than 90 ppm TSS. School personnel also gather rainfall data.

To this point, the system seems to be doing great. For example, BOD concentrations are consistently below 12 ppm, while TSS concentrations have always been less than 18 ppm. Even a spell of freezing temperatures that dipped to 17deg. F in December did not seem to adversely affect the health of elephant ears or other plants in the system. To prevent freeze damage, school maintenance personnel increased the amount of water in the cells to 24" to insulate the plants.

NOTE: For details, contact Awtrey at (409) 568-0414 or kawtrey@txso2.tx.nrcs.usda.gov.

Baylor Researchers Study Effectiveness of Disinfection Units

Researchers at Baylor University (BU) are now evaluating how well systems used to chlorinate wastewater effluent remove coliform bacteria. The work, led by Dudley Burton and David Jumper of the BU Institute for Environmental Studies, is especially important because there are many concerns that wastewaters from aerobic systems are often not properly chlorinated and could contaminate rivers, streams, and groundwater supplies. Ultimately, the researchers hope to evaluate existing systems and develop prototypes and standard designs that could be utilized to more effectively provide chlorination.

"Disinfection is a fundamental element of many on-site wastewater treatment systems," Burton explained, "because we don't want to release pathogenic bacteria into the environment. Chlorination is an especially appropriate area for research now, because the public, policy makers, and industry leaders are concerned about whether aerobic on-site systems are properly chlorinating wastewater."

Basically, there are a few common home-made and commercial designs utilized to chlorinate wastewater in on-site systems. Chlorine tablets are used for treatment because they are the simplest and least expensive method (liquid chlorine is too expensive and complicated). For example, a stack of flat, chlorine tablets is usually placed by the homeowner into a basket sited in an aerobic treatment unit. Typically, sodium hypochloride or calcium hypochloride is the form used for disinfection. The concept is that each time water pulses through the system (after a toilet is flushed, for example) the water level will rise slightly and wastewaters will wash against the bottom tablet. As a result, chlorine will wash off the tablet and be diluted throughout the wastewater supply.

The goal, Burton says, is to provide a rapid dose of chlorine to treat the wastewater and remove coliform bacteria without leaving a residual dose of chlorine that would be strong enough to be harmful to the environment. "We don't want the chlorine tablets to be in contact with the wastewater for a prolonged time period because that may release too much chlorine," Burton says. "We want the tablets to dissolve and distribute chlorine only when pulses of wastewater flow through the system."

"Strangely enough, units used to chlorinate on-site wastewater systems have never been evaluated by any regulatory or standard-setting agency," Burton says. "We hope that our efforts to evaluate the performance of existing and proposed systems may lead to the

development of standards and design criteria that could be utilized in many on-site wastewater applications. We are now designing the protocols we will use to test systems. One of the questions we want to ask is, "Do the systems that are out there meet the Federal criteria for fecal coliform and total coliform bacteria?"

A few issues are of major concern. For example, many systems now in use rely on homeowners to insert the chlorine tablets manually when they are needed. Because this is often inconvenient and perhaps even difficult for many residents, often the chlorine tablets are not inserted and no treatment occurs. As a result, Burton and Jumper hope to investigate the feasibility of developing systems that apply chlorine automatically. Another issue Burton and Jumper want to investigate is how to prevent "wicking," which occurs when wastewater comes into contact with a stack of chlorine tablets. The effect is that more chlorine is often released into the treated wastewater than desired. Burton and Jumper hope to evaluate various designs of stacking the tablets to reduce the amount of wicking that occurs.

So far, the research is in the initial stage. Once the project begins, Baylor will receive a uniform supply of clarified domestic wastewater from the Brazos River Authority. That wastewater will be utilized for microbiological testing that will be performed at Baylor. Ultimately, Burton and Jumper hope to expand the project by collecting wastewater samples from actual on-site wastewater systems from throughout the region, and by field testing the performance of disinfection units that are in actual operation.

For details, contact Burton at (817) 755-3405 or Dudley_Burton@Baylor.edu.

ASTM Symposium Focuses on Site Characterization, Design of On-Site Systems

The American Society for Testing and Materials (ASTM) recently sponsored a symposium that focused on on-site systems. The meeting, "Symposium on Site Characterization and Design of On-Site Septic Systems," met in New Orleans January 16-17.

Some of the papers presented at the meeting dealt with improving system performance, the use of distribution boxes, evaluation of pressurized distribution networks, design considerations for surface irrigation, long-term effluent absorption rates, and computer-aided design of on-site systems. Other papers describe nitrogen removal in septic tank effluent using biotextile filters, using soil morphology to design systems for wastewater treatment and reuse of domestic wastewater in a prototype residential home.

Sherman Hart of the Texas Natural Resource Conservation Commission presented a paper describing a method that utilizes both absorption and evapotranspiration to minimize the size of drainfields and wastewater disposal areas.

ASTM is currently developing standards and practices for technology dealing with the site characterization, design, construction, management, decommissioning, treatment capabilities, and inspection of on-site systems. ASTM has developed standards for

surface site characterization for on-site septic systems, subsurface site characterization of test pits for on-site septic systems, and preliminary sizing and delineation of soil absorption field areas for on-site septic systems. Currently, 20 more standards relating to on-site systems are being developed. A purpose of the symposium was to share information that will be useful in the creation of the standards.

NOTE: ASTM is planning to develop a special technical publication that includes many of the papers from that proceedings. ASTM hopes the book will be available by October 1997. You can contact ASTM for more information at their World Wide Web site at http://www.astm.org or you can call them at (610) 832-9585. For more details about Hart's paper, contact him at (512) 239-6020 or shart@tnrcc.state.tx.us.

NCSU Publishes Proceedings from On-Site Conference

North Carolina State University has recently published the proceedings from its 1996 on-site wastewater treatment conference. The proceedings are titled "Minimizing Impacts, Maximizing Resource Potential." Sections of the proceedings deal with such issues as soils as a treatment medium, renovation and performance of on-site wastewater systems, installation of innovative and alternative system components, troubleshooting low-pressure dosing systems, and soil properties. The conference was organized by David Lindbo of the Soil Sciences Department. For details, contact him at (919) 793-4428 or dlindbo@plymouth.ces.ncsu.edu. More information is on the web at http://plymouth.ces.state.nc.us/programs/OnSite96 .html.

Texas A&M University Researcher Develops Innovative Soil Training Methods

How do you train large numbers of people to become knowledgeable about which soil conditions are appropriate for on-site wastewater treatment and disposal systems? That's one of the major challenges now facing many soil scientists throughout Texas, who are working with the Texas Natural Resource Conservation Commission (TNRCC) and the Texas Engineering Extension Service (TEES) to develop a comprehensive soils training program.

Tom Hallmark, a researcher in the Soil and Crop Sciences Department at Texas A&M University (TAMU), is working with the TNRCC and TEES to develop programs to train on-site wastewater professionals in how to properly evaluate soils. By using innovative methods that emphasize hands-on training that may be especially effective for professionals working in the on-site wastewater field.

Hallmark became involved in soils analysis for on-site wastewater last year when he was asked to participate in the annual conference of the Texas On-Site Wastewater Treatment Research Council. At the conference, he presented a session with soil training. Later, he served on an ad-hoc committee on the need for soils training for professionals involved in the on-site wastewater industry.

"I feel the new regulations are a significant improvement because they are a more accurate reflection of the real ability of soils to absorb and treat wastes," Hallmark says. "Under the previous regulations, many of the soils in Texas would pass a percolation test at some time of the year but many on-site systems in these soils would fail at other times during the year. Under the new rules, it's easier to properly determine which soils are simply unsuitable for conventional on-site wastewater treatment and disposal methods."

Why Understanding Soils is Important

"One of the problems is that many different soils are just similar looking fields of dirt to many people who are not scientists," Hallmark says. "But the trained professional notices many obvious and subtle differences between various soil types. The important implication is that identifying soils and their properties is essential to understand why some soils will provide proper treatment for on-site wastewater systems and preserve groundwater quality."

There are a few principles that on-site wastewater professionals have to learn in order to properly assess soil characteristics, but these ideas need to be mastered if groundwater quality is to be protected.

Tom Hallmark of the Texas A&M University Soil and Crop Sciences Department identifies different soils using this three-dimensional display in the TAMU Heep Center. Hallmark says that visual aids like this one are great ways to help students learn about soils.

The major categories include: topography; the subsoil texture and structure; the suitability of soils at depths of greater than 2 feet below the soil surface; restrictive horizons; the presence of seasonally high groundwater tables; and the likelihood soils may be frequently flooded.

For example, Hallmark says that slopes on sites used for on-site wastewater systems should be less than 30%. The subsoil texture beneath the drainfield is especially important because it will influence the ability of water to flow through the soil. Most often, soil texture can be analyzed in the field by working with it and identifying if suitable soils (sandy and loamy soils) are present. The subsoil structure is important, Hallmark says, because it reflects the ability of water to flow through soil horizons. For example, the presence of "plate-like" structures and clay layers suggest that waters will have difficulty penetrating into the soil and not surfacing. Restrictive horizons, clay pans found throughout the state and compact loamy "fragipans" in Northeast Texas all retard the downward flow of water. The presence of perched water tables can be indicated by

black mottled patches (which suggest the presence of magnesium oxides) and gray colors (which are associated with reduced iron conditions).

Innovative Methods to Teach Soils

Hallmark has used a number of innovative teaching aids and methods to help students learn. For example, Hallmark and other soils faculty in the TAMU Soil and Crop Sciences Department have created a series of three-dimensional profiles of many Texas soils that hang from the walls of the Heep Center where the department is housed. These strips are roughly 5' long and 1' wide and show students how the soils really look and what features they need to learn when identifying these profiles in the field. He is now developing a teaching aid that will allow students to texture a soil sample and obtain rapid feedback about its percentage of sand, clay, and silt and which of four soil texture classes it fits into. Hallmark hopes to have this aid ready in time for the Conference.

"There's no way you can teach someone how to go out into the field and properly identify soils just through a lecture, although many key principles can be taught and learned in the classroom. The more important thing is to provide hands-on instruction where individuals work with the soil, handle it, and learn by doing. Learning if some soils will form ribbons or fall apart or can be molded into balls is a great experience that participants are not likely to forget."

Hallmark also teaches students how to use soils maps prepared by the U.S. Department of Agriculture Natural Resources Conservation Service, and other groups to get an initial idea of which sites in a county may be appropriate for on-site wastewater treatment. He is also exploring the use of the World Wide Web to access verbal and graphical definitions of many individual soil types.

Future Soils Training Needs and Opportunities

The TNRCC and TEES are developing training courses that will be used to teach about soils. The site evaluator and designated representatives courses will both include substantial amounts of soil training. Although final plans have not been formulated, the soils training will likely be a combination of in-class presentations and field experiences.

The in-class portion of the course will probably emphasize the fundamental requirements of soils for on-site wastewater treatment. An idea Hallmark is exploring is whether participants could be taken to large pits (typically 5' deep x 4' wide x 20' long) that are freshly dug with a backhoe. Students could learn how to identify critical soil features. "You can think of this as a drivers' education course," Hallmark says. "The in-class materials will be like book learning, which of course, is needed. The work in the pits will be where the students get behind the wheel and go out on the freeway."

Summary

The goal is to provide comprehensive soils training for professionals who will be evaluating the suitability of sites for on-site wastewater systems. At the same time, soils professionals will become educated about the specific soils needs of on-site wastewater systems. For details, contact Hallmark at (409) 845-4678 or hallmark@tamu.edu.